For example, GPS signals may be used to set all the mobile units to the same frequency. The phase of the mobile units may be controlled as well.

It will be recognized that the foregoing is but one example of an apparatus and method within the scope of the present invention and that various modifications will occur to those skilled in the art upon reading the disclosure set forth hereinbefore.

Claims

What is claimed is:

1. In a unidirectional or broadcasting communication system using OFDM transmission from a base station to subscriber units, means for achieving a bi-directional channel comprising:

A. transmitting means in the subscriber units for a transmission of signals that are orthogonal to the signals transmitted from the base station and are also orthogonal to signals from other subscriber units; and

B. receiving means in the base station for reception of said orthogonal signals.

2. The communication system according to claim 1, wherein the transmitting means in the subscriber include means for the transmission of the orthogonal signals using TD, TDD or FDD methods.

3. The communication system according to claim 1, wherein the base station and the subscriber units operate according to the DVB-T standard.

4. The communication system according to claim 1, wherein the base station and the subscriber units further include equalizing means and pulse shaping means for reducing the effects of multipath.

5. The communication system according to claim 1, wherein the signals transmitted from the base station include a guard time interval, and wherein the signals transmitted to the base station are synchronous with the guard time interval.

6. The communication system according to claim 1, further including signal shaping means in the receiver of the base station or in the receiver of the subscriber unit for an application of a window in time to signals received therein.

7. The communication system according to claim 1, further including signal shaping means in the transmitter of the base station or in the transmitter of the subscriber for an application of a window in time to signals transmitted therefrom.

8. The communication system according to claim 1, wherein said base station further includes means for the transmission of Automatic Synchronization Control (ASC) signals to said subscriber units, and wherein said subscriber units further include means for synchronizing transmissions therefrom responsive to said received ASC signals.

9. The communication system according to claim 1, wherein said base station further includes means for the transmission of Automatic Power Control (APC) signals to said subscriber units, and wherein said subscriber units further include means for controlling the power of transmissions therefrom responsive to said received APC signals.

10. The communication system according to claim 1, wherein the base station further transmits a pilot signal and wherein each subscriber unit further including means for generating the transmit signal having a frequency responsive to the frequency of the pilot signal.

11. The communication system according to claim 1, further including means for achieving a carrier frequency lock between the base station and the mobile users.

12. The communication system according to claim 1, wherein said subscriber units further include means for adapting the frequency of a clock used for transmission therefrom to frequency deviations of a signal from the base station, and for transmitting at a corrected frequency whose value is responsive to the frequency deviation, so that the signals received at the base has a frequency corrected for that deviation.

13. The communication system according to claim 1, further including means for implementing a dynamic allocation of carriers or TDMA slots to subscribers, according to their bandwidth demands.

14. The communication system according to claim 1, further including means for implementing a dynamic allocation of carriers or CDMA codes to subscribers, according to their bandwidth demands.

15. The communication system according to claim 1, wherein the OFDM system includes coding and decoding means comprising fast Fourier transform means.

16. The communication system according to claim 1, wherein the OFDM decoding means comprise an FFT processor operating on an input channel and a transversal filter means that reduces the pulse widening because of the window in transmitter.

17. In a communication system, a combination of CDMA modulation codes and OFDM coding/decoding means to achieve orthogonality between signals from the various users in the uplink.

18. The communication system according to claim 17, wherein the CDMA modulation codes comprise orthogonal Walsh codes.

19. In a communication system, a combination of OFDM and channeling means for achieving orthogonality between signals from the various users in the uplink.

20. The communication system according to claim 19, wherein the channeling means comprise TDD means or TD means or FDD means or a combination thereof.